Fabricaction of immediate interim complete dentures using modified Poly vinyl siloxane sectional impression technique: A Case Report

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Abstract

The immediate denture is a dental prosthesis constructed to replace the lost dentition, associated structures of the maxillae and mandible and inserted immediately following removal of the remaining teeth. The purpose of the present clinical report is to describe the use of a sectional impression tray technique that can prevent extraction of supporting teeth of patient's extensive fixed prosthesis, where the teeth were hopeless and fabricating an interim immediate complete denture was a treatment option to prevent patient's distress, anxiety and embarrassment. The present procedure was used to replicate the vertical dimension, phonetic and aesthetic of the existing fixed prostheses as part of an immediate denture and a final complete denture.

Key words: Immediate denture, Sectional tray, Sectional impression, Poly vinyl siloxane

Introduction

In 1860, Richardson described the use of immediate dentures.[1] An immediate complete denture is a dental prosthesis constructed to replace the lost structure and associated structure of the maxillae and/or mandible and inserted immediately following removal of remaining teeth.[2] In literature two types of immediate denture service is described conventional immediate dentures and interim immediate dentures. In the traditional type, the interim prosthesis is fabricated to immediately place after the extraction of natural teeth and can be used as the definitive or long-term prosthesis.[1,3] The interim type is used for a short time after tooth extraction. After the achievement of healing period, the immediate denture may be relined or replaced with the newly fabricated final denture.[4] The immediate denture treatment maintains patient's appearance, circumoral support; muscle tone, vertical dimension of occlusion; jaw relation and face height.[1,5] The patient's psychological and social well-being is preserved. There is less postoperative pain as extraction sites are protected. It is easier to duplicate natural tooth shape and position. Speech and mastication are rarely compromised and nutrition can be maintained.[1,6] Immediate dentures are more challenging modality than complete dentures because the presence of teeth makes impressions and maxillomandibular positions more difficult to record.[7] The anterior ridge undercut caused by presence of remaining teeth may interfere with the impression procedures.[8] Presence of different numbers of remaining teeth in various locations can lead to incorrect recording of the centric relation position.[9-13] More chair time, additional appointments are required leading to increased cost.[11,14,15]

Case Report

A 55 years old male patient reported to the Department of Prosthodontics and Crown & Bridge with the chief complaint of loose lower denture since 2 months. Also complained of poor esthetics, mobility and food lodgment in relation to the upper anterior fixed dental prosthesis. History of present illness revealed extractions of the mandibular teeth and maxillary posteriors 2 months back due to pain and mobility. Patient got mandibular transitional removable partial denture fabricated one and a half years back. There was no medical history relevant pertaining to case. The patient had wheatish complexion and normal gait. Intraoral examination revealed that teeth present were 13, 23, 35, 33, 43, 44 and 45. Fixed dental prosthesis in relation to 14, 13, 12, 11, 21, 22, 23, 24 fabricated 10 years ago (Fig. 1a,1b,1c) Generalized bone loss and gap between the prosthesis and the ridge resulted in frequent food lodgment and discomfort to the patient. The abutment teeth 13 and 23 showed gingival recession and bone loss resulting in grade 2 mobility of the prosthesis. Arch size of both maxillary and mandibular ridges was medium size and arch form of maxillary and mandibular ridges was square. Ridge form in maxillary ridge was U shaped and mandibular ridge was inverted U shaped. An orthopantograph of the patient revealed bone loss in maxillary anterior region upto the middle thirds of the roots. The diagnosis for maxillary was Kennedy's class I modification 1 and Kennedy's class I modification 2 partially edentulous mandibular arch. Fabrication of interim immediate maxillary and mandibular complete denture was planned. The patient was given various treatment options of full mouth extraction and rehabilitation with dental implants. The implant supported over dentures and also the conventional complete denture the other

options of rehabilitations were given in the treatment plan. As patient was a small screen actor by profession, he expressed anxiety towards extraction of teeth and prolonged duration of edentulism for conventional technique of fabrication of complete denture. Hence it was planned to provide an interim immediate complete dentures using sectional tray.

Primary Impression

1. Upper and lower stock trays were modified and trimmed in the dentulous portions of the arch.(Fig. 2, 3)
2. The intra oral examination of fit and extent of the stock tray was done (Fig. 4, 5)
3. Embrasures of teeth with closed contact points, fixed partial denture pontics that do not make tissue contact and undercuts on remaining teeth was blocked with condensation silicone putty material (zeta plus systems, Zhermack, Germany)
4. A primary impression of the edentulous areas was taken using condensation silicone putty material (zeta plus systems, Zhermack, Germany) and was later relined with light body (Orange wash, zeta plus systems, Zhermack, Germany)
5. The maxillary primary impression along the customized stock tray was picked up with irreversible hydrocolloid material (Algitex, DPI products, Mumbai) and mandiubular primary impression was picked up with the putty relined with light body condensation silicone (Fig. 6, 7)
6. The primary impression was poured using type III dentalstone (Goldstone, Asian chemicals, Rajkot) (Fig. 8, 9)

Secondary impression

1. A T-shaped wax spacers were designed over the maxillary primary cast (Fig. 10) using modeling wax (Hindustan modeling wax; Hindustan dental products, Hyderabad) and spacer wax was placed over the crest of the edentulous ridge of the mandibular primary cast (Fig. 11) separating media was applied dried and tissue part of the customized sectional tray was fabricated using autopolymerising acrylic resin (DPI Cold cure, DPI products, Mumbai)
2. For tooth part of the customized sectional tray fabrication a single thickness modeling wax was adapted over the teeth of the primary cast and tissue stops were placed (Fig. 12, 13)
3. Then the orthopedic plaster bandage (Fig.14) (Optyset, plaster of Paris bandage, Rupashree health care products, Bangalore) was manipulated[16] (Fig. 15) and placed over the modeling wax and tissue stops were made (Fig. 16, 17) on drying separating media was applied and teeth part of the customized sectional tray was fabricated with autopolymersing resin.
4. Metal clasp like device was made using 0.8mm orthodontic stainless steel wire to aid in orientation of the customized sectional tray (Fig. 18a and Fig. 19.a)
5. The intra oral examination of fit and extent of the customized sectional tray was done.
6. To achieve the impression in selective pressure technique, tray adhesive was applied to the trays and border moulding was done putty polyvinyl siloxanes material (Aquasil soft putty, Dentsply Caulk, Milford, DE) the wax spacers was removed and was relined light body (Aquasil ultra XLV, Dentsply Caulk, Milford, DE) (Fig. 20, 21)
7. Beading and boxing of secondary impression was done and type III dental stone was used to pour the master cast (Fig. 22, 23)

Fig. 1 a: Pre-operative intraoral view- anterior

Fig. 1b: Pre-operative intraoral view- right

Fig. 1c: Pre-operative intraoral view-left

Fig. 2: Customization of maxillary stock tray

Fig. 3: Customization of Mandibular stock

Fig. 4: Examination of the fit and stock tray extension- maxillary

Fig. 5: Examination of the fit and stock tray extension- mandibular

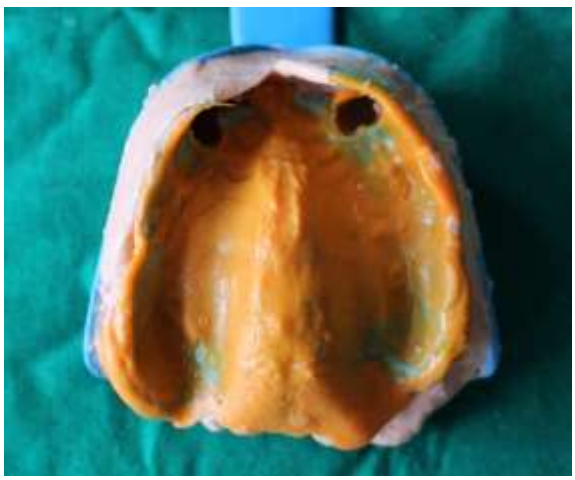

Fig. 6: Maxillary primary impression

Fig. 7: Mandibular primary impression

Fig. 8: Maxillary primary cast

Fig. 9: Mandibular primary cast

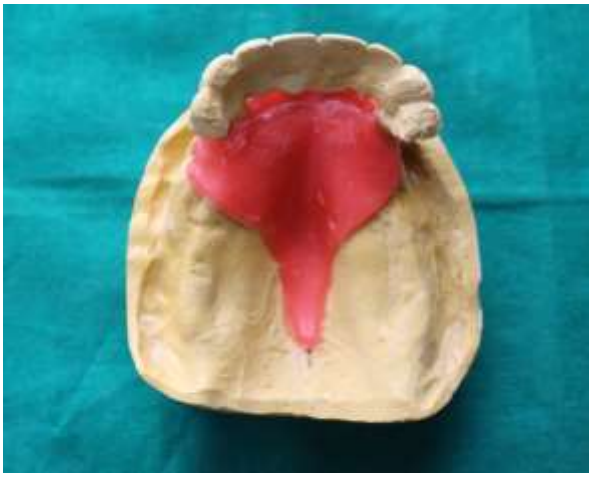

Fig. 10: T-shaped design of wax spacer for customized sectional tray- maxillary

Fig. 11: Design of wax spacer over the ridge crest for customized sectional tray- mandibular

Fig. 12: Wax spacer with stopper- maxillary

Fig. 13: Wax spacer with stopper- mandibular

Fig. 14: Orthopedic plaster for sectional tray fabriction

Fig. 15: Manipulation of orthopedic plaster for sectional tray fabriction

Fig. 16: Plaster spacer with stoppers- Maxillary

Fig. 17: Plaster spacer with stoppers- mandibular

Fig. 18 a: Maxillary customized sectional tray

Fig. 18 b: Maxillary sectional tray- intaglio

Fig. 19a: Mandibular customized sectional tray

Fig. 19b: Mandibular customized sectional

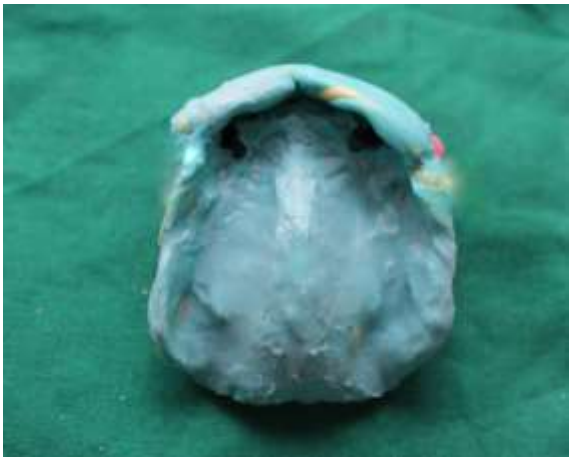

Fig. 20: Maxillary secondary impression

Fig. 21: Mandibular secondary impression

Fig. 22: Maxillary master cast

Fig. 23: Mandibular master cast

Fig. 24: Pre-operative profile view

Fig. 25: Post-operative profile view

Conclusion

The proposed technique of impression making prevented extraction of supporting teeth of patient's extensive fixed prosthesis (Fig. 24) and prolonged duration of edentulism for conventional technique of fabrication of complete denture. The technique of fabricating an interim immediate complete denture using the customized sectional tray prevented patient's distress, anxiety and embarrassment. The method overcomes the lack of standardization of spacing by using the orthopedic plaster rather than the plaster pumice mixture for spacing.[16] The present procedure was helpful to replicate the vertical dimension, phonetic and aesthetic of the existing fixed prostheses as part of an immediate denture (Fig. 25) and a final complete denture.

Acknowlegement

The authors reported no conflicts of interest related to study.

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